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SERIAL NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO.
08/214,339	03/16/94	FREYMAN	B M2556US

21M1/0418

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ART UNIT	PAPER NUMBER
2109	7

DATE MAILED:

04/18/96

Please find below a communication from the EXAMINER in charge of this application.

Commissioner of Patents

Office Action Summary

Application No.
08/214,339

Applicant(s)
Freyman et al.

Examiner
Robert J. Decker, Esq.

Group Art Unit
2109



☒ Responsive to communication(s) filed on Mar 16, 1994

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-22 is/are pending in the application.

Of the above, claim(s) 15-22 is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-14 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Part III DETAILED ACTION

Election/Restriction

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

Group I Claims 1-14, drawn to the substrate-based packaged electronic device, classified in Class 174, subclass 52.4.

Group II. Claims 15-22, drawn to a process for manufacturing the substrate-based packaged electronic device, classified in Class 29, subclass 827. The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as the product made and process of making. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (M.P.E.P. § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process such as applying a pre-molded encapsulant on the substrate rather than forming the encapsulant directly to the substrate.

Applicant is advised that the response to this requirement to be complete must include an election of the invention to be examined even though the requirement be not traversed.

3. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Mr. Thomas S. MacDonald on 3/15/96 a provisional election was made without traverse to prosecute the invention of Group I, Claims 1-14. Affirmation of this election must be made by applicant in responding to this Office action. Claims 15-22 are withdrawn from further consideration by the Examiner, 37 C.F.R. §1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

5. Claims 13 and 14 are rejected under 35 U.S.C. § 112, fourth paragraph, as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

7. Claims 1-9 and 11-14 are rejected under 35 U.S.C. § 103 as being unpatentable over Mullen, III et al. in view of Erdos.

Mullen, III et al. (Mullen herein after) discloses a substrate-based packaged electronic device comprising: substrates 22; solder pads 54 for making external electrical connections from the IC chip - SC device chip 24 to external components; and encapsulant - molding compound 26 made of a thermosetting epoxy resin material (col. 1, lines 32 & 46) formed on the IC chip (Figs. 2 & 5). Mullen does not disclose: a degating region or the material gold of which it is comprised of; a mold runner; or the relative adhesive limits of the encapsulant material, degating region, or the substrate material.

Erdos discloses an encapsulated IC chip package formed by degating (see Abstract) whereby the package has a degating region - carrier tape 10 made of metal (col. 4, lines 53-54) and a mold runner - runner components (col. 5, lines 60-61). It would have

been obvious to one of ordinary skill in the art at the time of the invention to have made the Mullen package with the Erdos degating and runner components so as to have the capability of separating the encapsulation during the fabrication of the package, as taught by Erdos, col. 5, lines 60-65.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the Mullen package with the Erdos degating region being made with gold since gold is one of a large number of metals which is art-recognized as having the electrical conductive properties necessary to make the connection from the degating region to the chips.

As discussed above, Erdos discloses the degating region separating from the encapsulant material, col. 5, lines 60-65. It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the Mullen package with the Erdos degating region and encapsulant such that the adhesive force between the encapsulant material and the degating region material is less than the adhesive force between the encapsulant material and the substrate material since it is inherent that the degating region must be less otherwise the degation or separation could not be made successfully as taught by Erdos, col. 5, lines 60-65.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have varied the levels of adhesion of the degating region, since it has been held

that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

8. Claim 10 is rejected under 35 U.S.C. § 103 as being unpatentable over Mullen and Erdos as applied to claims 1-9 above, and further in view of the applicant's admitted prior art, Fig. 1. The teachings of modified Mullen are discussed above and it does not disclose the substrate having electrically conductive traces. The applicant's admitted prior art of Fig. 1 discloses a substrate having electrically conductive traces. It would have been obvious to one of ordinary skill in the art at the time of the invention to have made the modified Mullen package with traces so as to provide electrical connections and communications.

Cited Art

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gupta and Millerick et al. disclose degating. Kobayashi et al. and Wong disclose IC packages having solder bump connections.

USPTO Communication

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert J.

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Decker whose telephone number is (703) 308-7614. The examiner can normally be reached on Monday through Friday from 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kristine Kincaid, can be reached on (703) 308-0640. The fax phone number for this Group is (703) 305-3431.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1782.

Kristine L. Kincaid
KRISTINE L. KINCAID
SUPERVISORY PATENT EXAMINER
GROUP 2100

April 12, 1996
Robert J. Decker, Esq.